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③⑤ TV game machine.

⑤⑦ A TV game machine having connectors for detachably connecting a plurality of memory cartridges each having at least non-volatile memories containing a game program, picture data and sound data, a cartridge selecting circuit for selecting one of the memory cartridges and making it accessible in cooperation with an externally controllable switch and the connectors, and a processor for executing the game program of the selected game cartridge while processing the picture data and sound data contained therein. A display panel is provided which is divided into a plurality of segments each corresponding to the respective game cartridges for illuminating one segment at a time in response to the command for the switch.

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## TV GAME MACHINE

The present invention relates to a TV game machine and specifically a TV game machine for a professional use.

With prior art TV game machines for a professional use, only one kind of game can be played with a single machine. To play a different game, it is necessary to replace a printed circuit board for a game with another one. A game machine with which a plural kinds of games can be played is required. But its mechanism has to be simple in order to prevent increase in cost. Also such a game machine is required to have means for informing the player of which one of the games he is currently playing.

It is an object of the present invention to provide a TV game machine which allows a player to select any one game from among a plurality of games and which is less costly.

In order to solve the above problems, the TV game machine according to the present invention comprises connecting means for detachably connecting a plurality of memory cartridges each comprising at least non-volatile memories containing a game program, picture data and sound data, a cartridge select circuit for selecting one of the memory cartridges and making it accessible in cooperation with an externally controllable switch and the connecting means, a display panel divided into a plurality of segments each corresponding to the respective game cartridges for illuminating one segment at a time in response to the command from the switch, and a processor for executing the game program of the selected game cartridge while processing the picture data and sound data contained therein.

By operating the switch, the cartridge select circuit selects a memory cartridge so that the processor can gain access thereto. At the same time, the segment in the display panel corresponding to the selected game is illuminated. Thus the player can clearly recognize the game which he is going to play.

According to the present invention, a plurality of memory cartridges can be detachably mounted on the TV game machine. The latter is provided with a panel showing the contents of the game and a switch for selecting one of these games. Thus a plurality of games can be played with a single game machine, instead of installing a plurality of game machines. This will lead to a reduction in cost. Also, by the provision of the display panel, the player can clearly recognize which one of the games he is currently playing.

Other features and objects of the present invention will become apparent from the following

description taken with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of the embodiment of the present invention;

Fig. 2 is a cross-sectional view of the display panel of the same;

Fig. 3 is an exploded perspective view of an example of the memory cartridge;

Fig. 4 is a block diagram showing the structure of the same; and

Fig. 5 is a block diagram showing the structure of the TV game machine.

As shown in Fig. 1, a TV game machine 1 comprises a cabinet 2, a CRT 3 mounted on the top of the cabinet 2, and a front control panel 4 provided with joysticks 5 and shot buttons 6, a game start button 7, and a game select switch 8. At the rear part of the cabinet 2, a display panel 9 stands upright. The cabinet 2 is also provided with a coin insert slot 10, a coin return opening 11 and an IC card insert slot 12.

The display panel 9 is divided into a plurality of (eight in the embodiment shown) segments 91 each used to illustrate the kind of a game, simple how-to-play instructions by letters and pictures, etc. By pressing the select button 8, one of the segments is illuminated to allow the player to distinguish the game selected.

As shown in Fig. 2, the panel 9 may comprise a transparent front plate 92 and a back plate 93 bonded together by adhesive. The front plate 92 is formed with grooves for inserting unit panels 95 each showing the kind of a game, how-to-play instructions, etc. Electroluminescence (EL) element plates 97 each having substantially the same shape and same area as the unit panels 95 are bonded to the back plate 93. Print wiring is formed on the back plate 93 to activate the EL element plates 97.

Figs. 3 and 4 show a memory cartridge 20 by way of example. It comprises top and bottom covers 21 and 22 and a printed circuit board 23. The covers 21 and 22 are bonded together to form a casing with the printed circuit board 23 housed therein.

A plurality of non-volatile memories 24 such as ROM's are mounted on the board 23 and connected to a group of pin electrodes 25 by suitable print wiring. The pin electrodes 25 are exposed to openings 26 and 26' formed in the front sides of the covers 21 and 22.

As shown in Fig. 4, the non-volatile memories 24 comprise a ROM 241 which contains picture images such as game characters, messages and letters, a ROM 242 for a sound program, a ROM 243 for synthesizing sound and a ROM 244 con-

taining a main program for the game.

The group of pin electrodes 25 are connected to an edge connector of the TV game machine 1 by setting the memory cartridge 20 in the cabinet 2 of the TV game machine.

Fig. 5 shows the internal structure of the game machine 1 by way of example.

Suppose now that a plurality (eight in the embodiment shown) of memory cartridges 20 are connected to the edge connector 30 and unit panels 95 corresponding to the respective memory cartridges 20 are fitted in the segments 91.

By pressing the select switch 8, the segments 91 will be illuminated one after another. The pressure on the switch 8 is released when the segment corresponding to a desired game is illuminated. At the same time, a desired cartridge is selected from among the plurality of cartridges 20 by a cartridge select circuit 31 and is put in an accessible state.

When a start button 7 is pressed, the program PRG 32 in the main body will allow a central processing unit 33 (such as 68000 CPU) and a sound processing unit (SPU) 34 (such as Z80 CPU) to gain access to the game main program ROM 244 and the sound program ROM 242, respectively.

Upon starting the game, the game main program is executed in response to the operation of the joysticks 5 and the shot buttons 6 to control a video processing circuit 35 and the SPU 34. The video processing circuit 35 gains access to the picture ROM 241 according to the control by CPU 33. The picture ROM 241 contains e.g. 4 x 1024 characters, each character consisting of 16 x 16 dots, each dot consisting of 4 bits. Four 1-megabit ROM's are needed to store this amount of information.

Multicolor representation is of course impossible with four-bit per dot. This four-bit per dot information is used only to specify the color storage numbers in a palette stored in RAM's (not shown) to which video processing circuit 35 can gain access. A V-RAM 36 contains a table showing in a one-to-one relationship the number and position of each character on the monitor 3 as well as an area for sprite. The video processing circuit 35 takes out the characters in the ROM's 241 while gaining access to the corresponding portions therein to give colors to the characters by the palette, which are then given as RGB signals.

The sound processing unit 34 runs the sound program in the ROM 242 as the main program progresses, to give sound outputs to an amplifier 39 according to the content of the sound synthesizing ROM 53 which are memorized as digital information, by actuating a sound source IC.

A work RAM (W-RAM) 40 is a memory for temporarily storing e.g. the current status and

score of the game. By transferring the content of this RAM to an IC card having a backup power supply inserted in the slot 12 (Fig. 1), the game can be resumed later.

## Claims

1. A TV game machine comprising connecting means for detachably connection a plurality of memory cartridges each comprising at least non-volatile memories containing a game program, picture data and sound data; a cartridge selecting circuit for selecting one of said memory cartridges and making it accessible in cooperation with an externally controllable switch and said connecting means: a display panel divided into a plurality of segments each corresponding to said respective game cartridges for illuminating one segment at a time in response to the command from said switch; and a processor for executing the game program of the selected game cartridge while processing the picture data and sound data contained therein.

2. A video games machine comprising a main unit housing a processor which can perform processing operations according to stored instructions so as to enable the playing of a video game, the stored instructions being derived from a cartridge detachably coupled to the unit via a connector means of the unit;

characterised in that the connector means is arranged to allow the simultaneous coupling to said unit of a plurality of cartridges each storing instructions for a respective game; and in that the main unit comprises switch means enabling a user to select one of the games, circuit means for rendering accessible the instructions stored by the cartridge corresponding to the selected game, and display means for indicating which of the games has been selected.

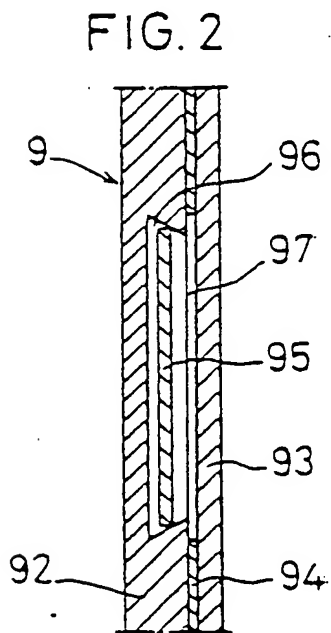
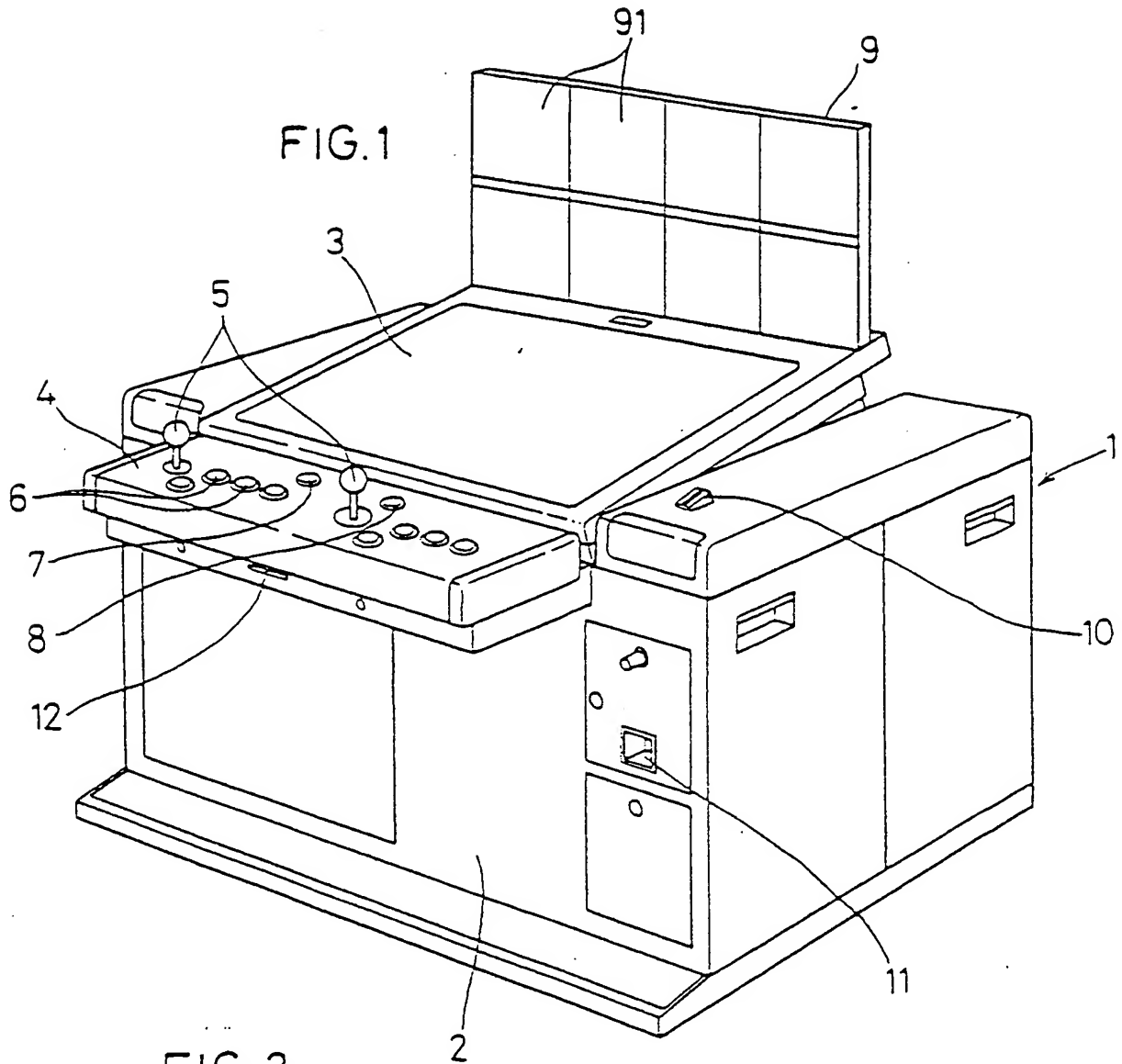


FIG. 3

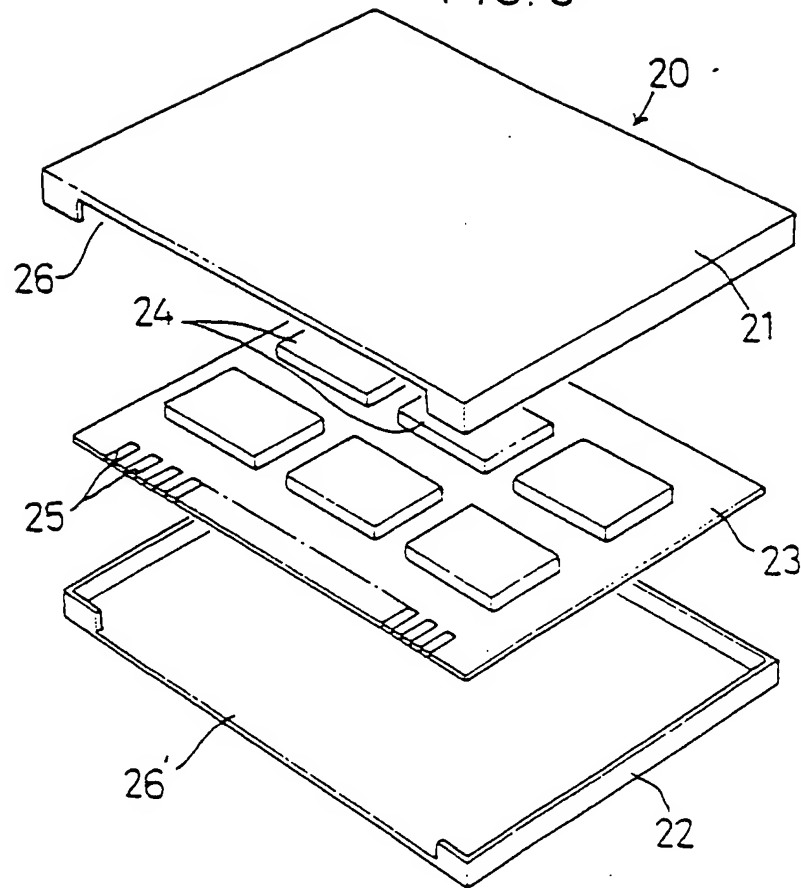


FIG. 4

